SonTek RiverSurveyor Quick Sheet

✓	DISCHARGE MEASUREMENT PROCEDURE
	1. Setup ADP and Other Equipment
	a. Attach ADP to mount or tethered boat
	b. Attach safety line to ADP
	c. Turn on computer before connecting ADP or data radios
	d. Turn off all automated field computer tasks/power saver settings
	e. Connect and turn on ADP\GPS\field computer\data radios
	f. Verify communication with all devices
	2. **Configure ADCP**
	a. Enter filename and magnetic declination
	b. Measure salinity and if not zero, enter salinity in ADP software
	c. Measure ADP depth and record in software and notes (beware of pitch and roll)
	d. Check and set ADCP clock time to appropriate time
	e. Perform and document compass calibration procedure
	f. Perform ADCP diagnostic tests and log results
	g. Locate appropriate measurement section / collect trial transect, if needed
	h. Select measurement site with uniform flow, no rapid drop-offs, and minimal unmeasured area
	i. Determine maximum profiling depth
	j. Configure ADCP using automated software tools, if possible
	k. Measure water temperature, record, and compare to ADCP measured temperature
	l. Fill out all field sheet with configuration and other information
	3. Prepare for discharge measurement
	a. Record moving-bed test (stationary or loop) Stationary moving bed test Duration of test = 600 seconds V_{mb}= Dist Upstream / Duration Moving bed if: Anchored or tethered $V_{mb}/V_w > 0.01$ Not Anchored Boat $V_{mb}/V_w > 0.02$ GPS Referenced $V_{mb}/V_w > 0.01$ V_w is the mean water velocity Loop test Compass must be calibrated Duration at least 3 minutes Boat speed less than 1.5 * water speed V_{mb}= Dist Upstream / Duration Moving bed if: $V_{mb} > 0.04$ ft/s and $V_{mb}/V_w > 0.01$ V_w is the mean water velocity
	d. Use GPS or other appropriate technique, if a moving bed is present
	e. Establish start/stop points
	iii. Need minimum of two depth cells with “good” velocity on each edge
	iv. May use buoys, pilings, poles, or other reference (avoid ferrous objects)
	4. Make discharge measurement
	a. Position boat at starting edge-of-water (two ‘good’ depth cells)
	i. Begin recording data
	ii. Measure and record distance to shore
	b. Hold position for minimum of 10 seconds
	c. Drive boat across the river
	i. Boat speed should be less than or equal to the water speed
	ii. Be a smooth operator
	d. Approach ending shore slowly
	i. Hold position for minimum of 10 seconds
	ii. Stop recording
	iii. Measure and record distance to shore
	iv. Collect 4 or more transects
	v. All transects must be within 5 percent of the mean discharge; except for unsteady flow conditions; if not, another set of transects should be measured and all transects collected averaged for the final discharge.
	e. Evaluate data in field, looking for potential problems in the data
	f. Make temporary backups before leaving the site

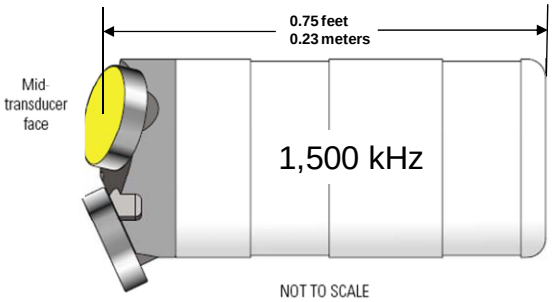
Recommendations and Limitations

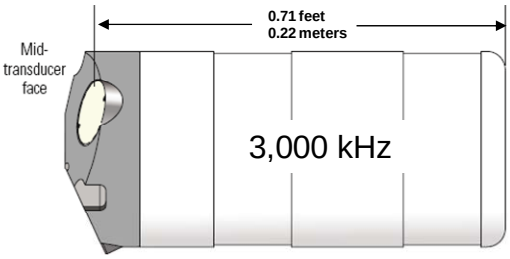
ADP Frequency (kHz)	Profiling Range [min. – max.] (m)	Cell Size [min. – max.] (m)	Blanking Distance [minimum] (m)	Max. Bottom Tracking Depth (m)
500	3 - 120	1 - 12	1	135
1,000	1.2 - 40	0.25 - 5	0.7	40
1,500	0.9 - 25	0.25 - 4	0.4	30
3,000	0.6 - 6	0.15 - 2	0.2	10

ADP Frequency (kHz)	Ping Rate (Hz)	Cell Size (m)	Single Ping Std. Dev. (cm/s)	1-Second Std. Dev. (cm/s)	5-Second Std. Dev. (cm/s)
500	4.5	0.5	94	44	20
500	4.5	1	47	22	10
1,000	12	0.25	94	27	12
1,000	12	0.5	47	14	6
1,500	9	0.25	63	21	9
1,500	9	0.5	31	10	5
3,000	20	0.15	52	12	5
3,000	20	0.25	31	7	3

Draft Measurement

(adapted from Oberg and others, 2005)





Helpful Shortcuts

F5	Start Pinging
F6	Stop Transect
F7	Start Recording
Alt-F7	Stop Recording
Ctrl-B	Reference - Bottom Track
Ctrl-G	Reference - GPS
Ctrl-E	English Units
Ctrl-M	Metric/SI Units
Ctrl-S	Communications Dialog
Ctrl-U	User Setup
Ctrl-H	Hardware Dialog
Ctrl-Y	Q Summary
Ctrl-D	Q Calculation Dialog
Ctrl-T	Q Report

+ (keypad) Scale Sticks Up
- (keypad) Scale Sticks Down

Stand-Alone ADP Connector Wiring

(adapted from Sontek, 2001)

IL-8-MP Pin No.	MIL-16-MP Pin No.	RS232	RS422
1	1	Vpower	Vpower
2	10	Data out	Tx+
3	11	Data in	Tx-
4	4 & 9	Drain	Drain
5	5	Not used	Not used
6	6	Not used	Rx+
7	14	Not Used	Rx-
8	16	Ground	Ground

Baud Rates

GPS Baud Rate: The minimum acceptable GPS baud rate depends on the number of NMEA 0183 data types being output but the following are good general guidelines.

GPS Update Rate	Baud Rate
1 Hz	4800 or higher
5 Hz	19.2k or higher
10 Hz	38.4k or higher